# The JOURNAL of the AMERICAN DENTAL HYGIENISTS' ASSOCIATION

VOL. VI SEPTEMBER, 1932 No. 9

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# The JOURNAL

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Volume VI SEPTEMBER, 1932 Number 9

CONTENTS

PAGE

The Origin and Progress of the Dental Hygienist ..... 3
*By A. C. Fones, D.D.S., Bridgeport, Conn.*

Dental Caries ..... 7
*By A. G. Schnack, A.M., M.D., Honolulu, T. H.*

Editorial ..... 16

Dental Hygiene In a Public Health Program—Why and How ..... 18
*By W. R. Wright, D.D.S., Jackson, Miss.*

The Dental Hygienist and Orthodontia ..... 23
*W. R. Dinham, D.M.D., Seattle, Wash.*

Book Reviews ..... 28

New Members ..... 15

Annual Meeting of the American Dental Hygienists' Association ..... 28

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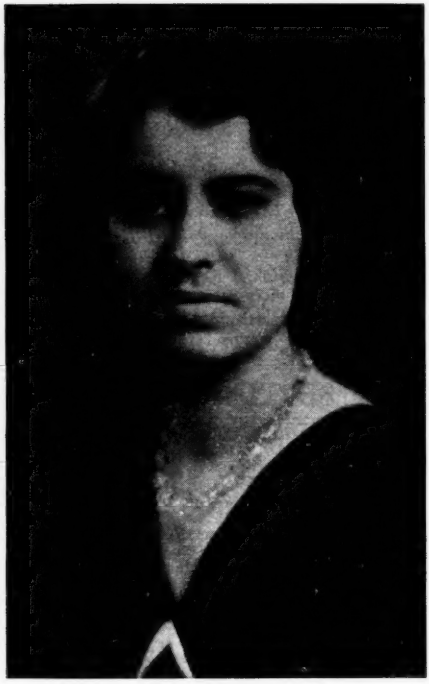

ALTHEA REED LOCKWOOD
BUFFALO, N. Y.

*Chairman, Business and Registration Committee*
*Ninth Annual Meeting*
*American Dental Hygienists' Association*

# The Origin and Progress of the Dental Hygienist

By A. C. FONES, D.D.S., *Bridgeport, Conn.*

(Read before the Georgia Dental Hygienists' Association Meeting, June 1932.)

IN selecting the title, I did not plan to review the historical facts in connection with the origin of the dental hygienist, as that phase has been made a matter of record in many publications. I expected rather to speak to you from the personal standpoint of what I had in mind during the inauguration of the first training classes, and how this conception grew in the light of our first experiences. No doubt the very title, "Dental Hygienist," will suggest to you that the origianl conception was of a *health worker,* so named to disassociate any thought of the treatment of disease which the name "Dental Nurse" seemed to suggest.

In September, 1913, the first course was announced for "hygienists and prophylactic operators," and I still believe that if you wish to serve the highest purpose in your calling you must consider yourselves first as hygienists and secondly as prophylactic operators, and that your training courses should be organized on that basis.

Doubtless you know that the first course for dental hygienists was inaugurated for the main purpose of producing a corps of trained hygienists to demonstrate the value of an educational and preventative dental clinic in public schools in contra distinction to relief and repair clinics, and still feel that public school service should continue to be the prime motive back of the course for dental hygienists. I am not intending to minimize the tremendous value of her service in private practice and I have no patience with the narrow and fear ridden view which has prevailed in some states to limit the work to public institutions and exclude private offices. Either dental hygienists are competent to practice anywhere for anyone under dental supervision or they are not competent to practice at all. It is because the public schools present the greatest fields for educational and preventive dental service, and that dentistry has an obligation to the public health which it seems to me only can be met by placing dental hygienists in every public school in this country.

Although our first course included lectures on general and personal hygiene, posture, chemistry of food and nutrition, etc., we had many things

to learn as the first hygienists gained experience in the public schools. To carry out efficient classroom instruction under the eye of a trained teacher required many, many additional hours devoted to courses in phychology, pedagogy and dietetics. The public school hygienists eventually qualified for the special teacher's certificate issued by the State Department of Education and by that time they felt at ease in the classrooms. I still believe that a special teacher's certificate or its equivalent is an essential for dental hygienists in public school work, and incidentally hygienists in all fields must welcome increased opportunities for expanding their educational qualifications.

Doubtless some of you are familiar with these statistics, but I think it is most interesting to know that in barely eighteen years since the first dental hygienist entered the field, so much progress has been made. Geographically the movement has spread over a large area, and thirty-one states, including the Territory of Hawaii have legally provided for licensing and regulating the practice of dental hygienists. There are of course, always other states in which the matter is under discussion. Training courses for dental hygienists are conducted in sixteen schools and, with the exception of your local course, they are in association with fifteen dental schools, the names and standing of which furnish undeniable proof of the value of this specialty in the minds of dental education authorities.

There are about three thousand five hundred members of your profession practicing in this country and the numbers are increasing yearly. The range of service includes public schools, private offices, hospitals, industrial and institutional clinics, university health centers, State departments of public health and the United States Department of Public Health. The great majority of the dental hygienists are organized in the American Dental Hygienists' Association and seveenteen component societies.

The dentists of both the American and the State societies have extended the courtesy to the hygienist of meeting with them, and it is to be hoped that the hygienist will always prove herself worthy, that this educational opportunity may continue to exist. This is sufficient to show you that the dental hygienist movement is progressing and has made rapid advancement in a very short period of time.

In order that this picture of your progress may not appear too rosy, we must realize that not all dentists are friendly to this movement and that there are several states where there is not sufficient interest or where there is sufficient objection to prevent the legalizing of dental hygienists. The reports from a few states where hygienists are regulated by law are not favorable, and doubtless there are just criticisms that may be made of in-

dividual hygienists. I know and you know that these are not problems relating to the dental hygienist profession alone, but are problems of human nature in relation to any profession. However, as individual hygienists you must all realize that unethical actions reflect not only upon the individual, but create prejudice against a new profession which has not as yet become firmly established in all states.

I have repeatedly stated that I have yet to hear of a dental hygienist having a license revoked for violating provisions of the clauses relating to her practice. This reflects most creditably upon the moral and ethical standards of the women whom this profession attracts.

In looking to the future there is much that the organized hygienists must consider for the good of this comparatively new profession. The education of dental hygienists needs constant improving, and just as dental courses have gradually lengthened to provide for more adequate training, so the trend of hygienist schools is definitely toward the two year courses. Six of the fifteen schools in association with dental colleges have already adopted the two year course, and three of the remaining nine schools have the lengthened course under consideration. They must all finally come to it. It was not practical to start with, to have longer than a one year course, just as many of our major professions began simply but now require four years. The need of the hygienist has been so positively demonstrated that the time has come when the course should be extended to two years. I was very much pleased to find that this is also the opinion of the large majority of the members who co-operated in the survey on educational standards for dental hygienists conducted by the American Dental Association. Nothing argues so well for progress as to have the members of your association cognizant of the short comings of a year's training and anxious to co-operate in the necessary steps for advanced educational requirements.

Personally I do not favor devoting a portion of the course to training in chair assistance and office routine. Although the need for such assistance is apparent, this assistant should not be the dental hygienist. Her field of service is in no way analogous to that of the nurse or chair assistant. Although it is very desirable that she should be competent and willing to co-operate in any way to maintain the routine of an office or clinic, it is not desirable that her efforts should be continually diverted into service which does not require her highly specialized training.

There is ample material that may be profitably inserted in the two year curriculum to produce the type of dental hygienist I have in mind—one who is primarily competent to teach the laws of health. It does not matter

whether she is attracted to private practice or public health work, a training in the ability to impart her knowledge to others is a tremendous asset and the most valuable service she can render. All this must come as a part of the standardization of hygienist courses. We must not be training them as teachers in one part of the country, and as high grade assistants and competent anesthetists in another part. The name Dental Hygienist should signify a woman who has received a standard education and training in a definite field of service, and incidentally the standardization of the name would eliminate much confusion in the minds of many.

Other considerations for the future include standardization of the preliminary educational qualifications. A prospective dental hygienst should most certainly be a high school graduate. This qualification does not need to be inserted in the dental law, but it does need to be a standard entrance requirement for training schools.

It will be many years before standardization of dental hygienist laws can be secured, but the problem of reciprocity can never be settled until the states approximate each other in requirements for educational qualifications and training.

I have only attempted to touch briefly on the many phases that dental hygienists must work out for future progress, but one of the most important has been left to the last and that is organization. Organized dental hygienists will eventually accomplish the seeming impossible, so I ask you to co-operate by being an active members of you local, state and national associations, and by encouraging your fellow workers in other states to band together into societies and to join the national organization so that you may all be travelling together on the long road ahead.

# Dental Caries

By A. G. SCHNACK, A.M., M.D., *Honolulu, T. H.*

*Reprinted from The Journal of the American Dental Association, Vol. XIX, Pages 62-68, Jan., 1932.*

WE ARE still far from a solution of the etiologic problems that have arisen in the study of dental caries. There are a considerable number of investigators who are individually convinced that the etiology of caries is settled, but the viewpoints are as different as night is from day. It may be stated here that while much of the work done may in some way or other be eventually assembled into a common truth, we have as yet not produced much evidence that may be considered in the light of actual proof. Some of us have perhaps not had the opportunity to splash about a laboratory deducing opinions from test-tube findings, or to enter the field of experimental biology, but we can take the findings of the numerous investigators as published and perhaps pick out the "wheat from the chaff," which, combined with our personal ability to observe and compare dental and other body processes, may lead us to a proper viewpoint.

Our roentgenologic evidence and our gross and microscopic pathologic dental processes have a very wide range of interpretation, and one would perhaps be astonished to find how great this variance of opinion of the basic conditions is. In other words, a supposedly simple dental condition, such as caries, may mean one thing to one investigator and an entirely different thing to another. Unless we can start with a few uniform conceptions of what we are trying to prove, the problem of etiology must necessarily have an endless number of solutions.

A detailed description of the numerous theories offered will not be attempted, but some of the ideas presented will be briefly mentioned, and a few theories, perhaps deduced from comparisons with similar processes in other body tissues, may change the viewpoint of some of the investigators, and perhaps offer new tangents for investigative endeavor. No theory can be presented without the expectation of having it partially or completely refuted.

The study of caries involves consideration of a number of facts. The theory of lymph circulation through enamel, considered by some as established facts and by an equal number as nonexistent, has perhaps more evidence in substantiation than otherwise.[1] The finding of definite lym-

1. Beust, T. B.: Physiologic Changes in Structure of Enamel After Tooth Eruption, J. A. D. A., 11:396 (May) 1924.

phatic channels in the enamel, arising from the dentino-enamel junction, in animals of a lower scale of development is important in these deductions. The staining of the enamel through dye injection of the pulp, etc., favors the idea of a lymphatic circulation through the enamel.

The organic matrix of the enamel may be in great part the means of diffusing substances through the enamel. That such a circulation should affect the mineral contents of the enamel to some extent under varying conditions must be expected. We might expect a diminished calcium content of the enamel under long continued conditions of diminished lime contents of the blood.

In chronic interstitial nephritis with diminished blood calcium, we fail to note any special measurable dental effect. In osseous tissue, disuse produces a rapid absorption of lime, but the loss of lime from dental disuse is not a proven fact. That teeth actually harden with age is thought a definite fact in spite of probable diminishing use. Dehydration, physical and chemical internal rearrangement of molecules and the gradual deposit of secondary dentin may aid in the production of this apparent increase in density.

We all see the results of endocrine disturbances on tooth structure. Chronic disease, such as syphilis, and inherited tendencies, etc., may all produce defective dental structure. We might state that any "sick cell," or cell working in an unfavorable environment should not be expected to produce normal dental structure, and such defective structure should present points of less resistance to caries.

Vitamin deficiency experiments on animals may show most strikingly defective tooth development, which tends later to a readier development of caries and the production of an oral state (spongy gums, anemia, etc.) which of itself will tend to destroy even normal dental structures. Such conditions do not obtain in the consideration of ordinary caries.

It is assumed that a lymphatic flow takes place through the enamel by way of the dentinal tubules and enamel lamellæ, and that this lymph flow originates from the pulp lymphatics. It is apparent that most of the lymph flow through the enamel must come from the pulp lymphatics, although it is well established that the alveolar socket communicates by fine fibrillary connections with the cementum (Sharpy's fibers), and thus a circulation in the enamel is possibly established through the marginal plexus.[2] This supply of lymph must of necessity be very small and can hardly contribute much to the nourishment of enamel or to changes in the enamel

2. Orban, Balint: Dental Histology and Embryology, Philadelphia: P. Blakiston's Son & Co., 1929.

after dental eruption. In other words, we must insist on a functioning pulp for any appreciable lymph flow through the enamel structures.

That minor changes take place in the enamel structures through the pulp circulation in disease or with continued variations in blood elements can easily be accepted. That these slight enamel changes in erupted teeth are responsible in great part for dental caries is a contention that does not rest on fact. It is my opinion that, should this contention be true, it would mean that an intact pulp would be necessary in all cases of caries. We have all seen teeth undergoing decay that have had root fillings for many years. Some of these teeth, through apical infection, may have lost much of their cementum attachment, and thus even this source of lymphatic flow is diminished or eliminated. These teeth may remain intact for a long time after restorative work has been completed, only suddenly to become carious.

One cannot consider that anything but an extra-dental oral influence causes decay in such cases, and this should pretty well establish the necesity for investigation of caries from this viewpoint. Recent experiments[3] would indicate that caries does not necessarily progress rapidly in the absence of saliva, and this is taken as a proof that the diluting and cleansing action of saliva is not of importance in the prevention of caries.

Such a conclusion, in my estimation, should never have been deduced from these experiments. There is always an optimum range of dilution of fermentable food material to produce a maximum of acid fermentation. Complete absence of saliva or a local dilution which is only that of moist material should not produce the optimum fermentative conditions, especially when there is no amylase to reduce the starches to a more fermentable state. Stagnant saliva, we still think, offers the best environment for fermentation.

There is a greatly diminished flow of saliva during sleep and during certain illnesses is apparent. The quantity of saliva secreted in an average day by an adult is estimated at in the neighborhood of 1,500 c.c. Some have pointed to drooling during sleep as evidence that saliva does not cease to flow. The amount secreted during sleep is negligible. The various salivary stimulants, which we shall not describe, practically all require the waking state for their effectiveness.

It should be definitely understood that dental caries is primarily a solution of lime salts through the action of acids. Such acids, although possibly regurgitated from the stomach, are thought to be produced in the mouth through fermentation (lactic and acetic acids) by the acid producing

3. Montgomery, M. F.: Effect on Teeth of Total Absence Salivary Secretion, J. A. D. A., 17:1338 (July) 1930.

bacteria (acidophilus, etc.). Whether the enamel rods or the interprismatic substance is primarily attacked has no direct bearing on the problem.

It has been suggested[4] that perhaps altered blood conditions help to produce a saliva deficient in alkalis, and thus the diminished alkali reserve is quickly overcome by the acid fermentation, concentration of acid resulting which attacks the lime content of the teeth.

The argument presented above, namely, that a total absence of saliva does not induce caries, would tend to refute this statement. Such variations in the buffer action of saliva must be small under different conditions and would be difficult to demonstrate under the varying daily conditions, and with the changes occuring in the saliva after secretion. Assuming that a special oral state must exist for the development of caries, it must be a state conducive to the formation of acid.

It is my contention that the two necessary conditions are stagnation of oral fluid, allowing concentration for considerable time, as in sleep, and, secondly, the establishment of acid-producing organisms, probably as a predominant type. It is hardly conceivable that much fermentation can occur on a pure meat diet; a fermentable carbohydrate is a first essential. Dilution of the acid during the waking hours, by food, water and other liquids, and by saliva, would hardly permit sufficient concentration to allow solution of enamel. Interproximal food plaques may, in many cases, carry fermentable substances capable of producing concentrated acid products that can destroy enamel. Experiments have been performed to show the harmlessness of candy, but these experiments do not show that the carbohydrates are given just at bedtime, when we should expect the proper conditions for the concentration of acids by fermentation.

The nature of a carbohydrate is quite important from more than the fermentability aspect. We have a highly fermentable Hawaiian foodstuff, "poi," which has been credited with having marked anticaries properties from the fact that although it forms the chief constituent of the native Hawaiian diet, our native Hawaiians, as a rule, have very little caries.

Poi is very sticky when it touches anything dry, but in the mouth it is very cohesive and never clings to the mouth or teeth, leaving no oral residue. It is my contention that we must carefully consider fermentable foodstuffs from their tendency to invade and adhere to the tooth crevices or to the tongue surface, and that we need not think so much in terms of any special anticalcifying or vitamin agents. Mellanby[5] has attributed

4. Jones, Martha R.: Larsen, N. P.; Pritchard, G. P.: Dental Disease in Hawaii, Dent. Cosmos, 72:439 (May), 574 (June) 1930.

5. Mellanby, May: Influence of Diet on Structure of Teeth, Physiol. Rev., 8.545 (Oct.) 1928.

anticalcifying properties to certain cereals, but it is my conviction that the lack of cohesion in the mouth is more important.

That the character of the fermentable food is very important can perhaps best be shown by several examples.

In one case, a nurse, because of an ethmoiditis and optic neuritis of over a year's standing, had a set of dental roentgenograms taken. There was practically no evidence of caries. The patient was sent for a three months' vacation to a brisk climate for a rest. She rested considerably and felt greatly refreshed on her return. Because of a slight pain in a tooth, she had another set of roentgenograms taken. This time, eight dental cavities were revealed, several just about reaching the pulp chamber. The history was that the patient ate well, gained weight and attained a feeling of well-being, but over-indulged in candy, often taking a box of candy to bed at night.

Another example of changed diet that was not solved directly but was interesting was met when the German cruiser Emden touched at this port on a world cruise. At one dentist's office, about a dozen of the sailors sought dental care, all presenting the same story. Up to six months previously, at the beginning of the cruise, none of these men had had any evidence of dental caries, and several now had as many as four easily located cavities. (Roentgenograms were not taken.) The general condition of these young men was excellent, and they had actually improved physically in every case, but still had developed caries.

One can hardly conceive of defective dental structure manifesting itself so suddenly after twenty years or more.

The importance of establishing a predominating fermenting organism for the production of rapid caries is probably great. That this can easily be done is not apparent. The pabulum is probably determinative of just what organism will predominate to a great extent. We must not forget the role of salivary amylase (ptyalin) in changing starches into an easily fermentable state.

The rate of growth of different organisms is also important. A preponderance of fermentable carbohydrates favors the establishment of a predominating acid-producing organism. For example, we know that the fermentation diarrheas of infants are easily combated by a reduction of the carbohydrate elements of the food and an increase of the protein elements, the fermentative organisms thus being crowded out, through diminished nourishment, and the antagonistic putrefactive organisms favored. A liberal dose of lactose favors the establishment of *Bacillus acidophilus* and a pabulum rich in fermentable carbohydrates must be maintained.

It has been argued that the presence of tartar plaques on the teeth

should be conducive to the formation of caries. That one rarely finds caries in the immediate region of a tartar deposit is easily explained by the fact that these plaques containing glucoprotiens, which are not fermentative, have much lime (phosphates and carbonates), which would necessarily offer resistance to the concentration of acid products and would have to be destroyed before the underlying enamel could be attacked. Many persons who do not brush the teeth will show such tartar deposits, which perhaps explain why the teeth are sound in spite of neglect.

Another statement advanced against stagnation as a factor in the formation of caries is that we often do not find caries in the presence of pyorrheal pockets. Alveoloclasia, or destruction of the alveolus, is in no way comparable to caries, which is merely solution of lime (in this case, enamel) by acid. Pyorrhea originating as a gingivitis results in an entirely different state. We need not have any acid accumulation in a pyorrheal pocket. Pyorrhea is the result of inflammation. Pus cells accumulate. The flow of the pus is outward into the buccal cavity, and it would be unusual, although possible, for food to remain over any great period in such a pocket. A small pocket forms under the gingiva, perhaps at first without absorption of the alveolar walls. Soon, pressure (which may be quite slight) develops locally and absorption of bone takes place, not through solution by acids but by the action of osteoclastic cells, an entirely different phenomenon.

Those who doubt that slight abnormal pressure can have such end-results, should recall the so-called "erosion" of the bony portions of the vertebral bodies by an aneurysm. Surely, the mechanical trauma here is not sufficient to produce such effects. We have merely a soft, intermittent but, what is more important, abnormal pressure applied in an unusual location, and the osteoclasts complete the work of destruction. The so-called apical abscesses of teeth also are apparently the result of bone absorption by tissure cells. Relieve the pressure in the abscess about the apex of the tooth, and we no longer have absorption but deposition of bone, even though it may take a long time to assume the normal appearance of the surrounding healthy bone, because of the irritation of the local infection, etc.

Pressure applied to a protruding abdomen will cause absorption to excess fat. Skull bones will be absorbed in the presence of tumors which do not invade the bone but exert a very slight local pressure. A pyorrheal pocket presents a condition of putrefaction and pus production rather than acid fermentation, and we should not look for caries.

We have a condition which, although present in other localities to some degree, is quite prevalent among our local children, especially the Japanese. Simonton and Jones have elected to call this condition "odontoclasia," and it

is described as a rapid massive destruction of the enamel and dentin, generally of the deciduous teeth. Attempts to explain this phenomenon have been made on the basis of rickets and various other conditions. It is prevalent in Japan and the Orientals seem to be chiefly involved.

My experience shows that nothing abnormal can be seen in the enamel structure of these teeth before eruption as determiend by the roentgen rays. Another fact that might be mentioned here is that the permanent teeth are generally well-developed and caries resisting. The Oriental seems to be more prone to the development of pyorrhea of a severe type early in life. The fact that, after weannig, the child lives on the same diet as the mother, and that the mother's diet is the same during and after pregnancy, makes it difficult to determine just why we see such massive destruction of deciduous teeth, and apparently caries-resisting permanent teeth.

Should the condition of caries be blood-borne, we should expect to see the permenent set show evidence of deterioration. We must remember here that while the deciduous teeth are being destroyed, the patient is developing in most cases a perfect set of permanent teeth, which will remain intact. We find "odontoclasia" in wonderfully healthy looking children as well as in the undernourished.

We must look for the source of caries in an altered oral state. As stated above, it is my opinion that we need not seek this factor in a variation in the chemical constituents of the blood, which may directly affect the teeth or produce an indirect effect by allowing the accumulation of destructive acid through a diminished salivary buffer potency. The fact that the "odontoclasia" may with fair certainty be arrested at any period, by certain alteration in the diet, should not argue for an altered condition of the blood. Our "poi" diet has apparently a good effect when it is substituted for other food. It is not a high mineral-containing food, and it has a high starch content, but it also has the valuable quality of cohesion in the mouth, not leaving an oral residue.

Vitamins cannot reasonably be considered important here. Saliva as secreted varies between a 5.5. and 7pH and of itself should not have any dissolving action on enamel, a pH of 5.5 being the equivalent of one five hundred thousandth gram of normal hydrochloric acid containing one five millionth gram of hydrogen in 100 c.c of fluid. This naturally is not sufficiently acid to have any direct lime-dissolving action under ordinary conditions. The loss of available buffer in reducing saliva to this acidity might, of course, be important. It is hardly probable that variations in food can directly affect the hydrogen-ion contents of saliva and be directly responsible for caries.

Our Japanese have an almost universal habit of pampering babies with

sweets. To give the baby sugar tied in a cloth to suck is considered the very best way to induce sleep. This is dispensed with after a few years. It is suprising how widespread this procedure is among the Japanese. We have here all the ideal conditions for the production of acid mouth—sleep with its accompanying stagnation of saliva containing fermentable carbohydrates and ideal temperature and moisture conditions for the establishment of acid-producing organisms as a predominant type. Deciduous teeth are not structurally so nearly perfect as the permanent teeth, and this should also favor decay. Destruction of teeth under these circumstances is a most rapid process, the teeth barely erupting before they become eroded level with the gums in many cases. I cannot contend that every case of "odontoclasia" can be thus easily explained, as history-taking is most unsatisfactory with many of the parents.

Much has been written about the acid-base balance of the blood as a factor in caries. Some investigators would put all the emphasis on the effect of these blood variations on tooth structure during their development, insisting that later caries is merely a manifestation of poor development. Other investigators insist that the diet, with its resulting variation in blood elements, whether produced by vitamin deficiency, deficiency of ash-producing foods, or the tendency to acid or base-producing qualities has an immediate direct effect on adult teeth. Our Oriental rice eater should theoretically from the acid reaction from his diet develop caries, but we find very little caries, and instead the antagonistic state of pyorrhea.

We have explained that a pulpless tooth has prectically no circulation and may or may not become caries. Another point held by the many investigators is that the concentration of lime in enamel is very important in determining whether caries will or not develop. It is hard to see why a little variation in the lime content should make any difference. If the facts are analyzed, the organic elements of a tooth (enamel cuticle and stroma) are probably the caries resisting part of a tooth in the early stages of cavity formation, as lime itself (enamel) without its organic matrix would not last long. Caries does not develop on the mechanically eroding surfaces of enamel.

It may be that not enough attention has been given to the possibility that much of the rapid dental caries may be due to an acid regurgitation from the stomach. The "upset" stomach, with a foul breath and coated tongue, may represent a disturbance tending to an imperceptible regurgitation of gastric contents.

The frequency of massive third molar decay may be in great part due to faulty enamel structure, but its proximity to eructated gastric contents

may be important. It would be interesting to note the infrequency of decay in its association with gastric anacidity, should this be a fact. Do certain foodstuffs in super-abundance tend to produce gastric regurgitation? In illness or in certain nervous states, gastric atony and loss of sphincteric tone may similarly favor regurgitation of gastric juice.

CONCLUSION

Caries is in great part the result of the solution of enamel lime salts by acids in the mouth. Our findings regarding the pulpless tooth and other factors in the decay of teeth do not favor blood changes as the direct influence in the production of caries. Three possibilities exist as the fundamental causative agent in the development of dental caries: 1. A diminished "buffer" action of the saliva favoring the easy concentration of oral acid through bacterial fermentation. This diminished alkalinity may be the result of ingestion of certain food-stuffs, or of other conditions. 2. Imperceptible acid regurgitation from the stomach. 3. Acid fermentation in the mouth through the agency of acid-producing organisms, favored by highly fermentative adherent foodstuffs, with oral stagnation and concentration during sleeping hours, illness, etc. The proof of any of these theories would entail more painstaking endeavor.

---

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# Editorial

## WHAT CONSTITUTES SUCCESS?

*Three things are given for man to do*
*To dare· to labor and to grow.*
*Not otherwise to earth we came*
*Nor otherwise we go.*

BLISS CARMEN

EACH one of us from early morn to setting sun are devout in our efforts to do our best but very often we lack the courage and gain success-selfishly, for ourselves; unselfishly for our profession we must be at least daring enough to carry out our own ideas if we think them worthwhile.

Whether it be lack of initiative or just timidity is a question that confronts me almost daily as I view different girls at work. Many have such splendid ideas and make them play a most important part in their yearly programs. Others go along not one step in advance of what they learned while still in Training School.

Too often the answer is, "I felt I had better not try this or that. You do not know the conditions with which I have to contend." And no one will better those conditions until some one has actually tried. It is my impression that we do not have

sufficient pride in our profession to make others appreciate its value otherwise, we would not in the majority of cases have to make apologies for our inability to put our work across.

Why is it that teachers in various fields find it so simple to demand that every effort be placed upon their subject? It is because they believe it to be more important than all others and have made others feel the same. We can do the same but it takes courage and it also takes much hard work. Not only a few hours directed by the clock or the regular activities of the school or office but concentrated study after those hours are over.

Far be it from me to advise you with efforts beyond your strength. You may give so much during the day that the few hours of the day that are left are needed for recreation in order to fit yourself for the coming day but I am in the same manner convinced—if we love our work sufficiently to make that work a pleasure, we cannot forget it entirely. People in other professions devote many outside hours to studying details that will make for perfection in their daily tasks. We cannot afford to waste ours entirely. Our days are too well filled with the mechanical side of our duties and we can afford little of the time for anything else. We must keep abreast with the times and yet we must not let a few be responsible for all that will tend to make our efforts more thoroughly appreciated.

Develope every opportunity that you have; dedicate yourself to those ideals that you represent; believe in yourself and then do what you know to be right. Work at it with all your will and the growth will take care of itself. If you will but strive to do these things you will live to see your profession the greatest among the great—serving humanity and your success—your happiness will be the knowledge that you helped to make it so.

# Dental Hygiene in a Public Health Program - - Why and How

W. R. WRIGHT, D.D.S., *Jackson, Miss., Dental Member of Mississippi State Board of Health.*

(Read before Annual Meeting of Mississippi Health Officers, 1931)

UNQUESTIONABLY the cause of public health has been furthered and aided by the mouth hygiene movement. Mouth conditions have always been a large problem in public health. Dental hygiene has developed as result of a pressing present-day need.

Those who should know, tell us that there is a tremendous incidence of dental disease among all classes of people, from pre-school aged to the adult —50 to 80 per cent of all children entering school, 75 to 90 per cent of school children, 80 to 90 per cent of industrial and institutional groups are said to have had or have dental disease. One ambitious statistician computed that there are at least 400 million bad teeth, averaging four to each person. The Director of the Dental Division of the Metropolitan Life Insurance Company states that in twelve years, examining 20,000 employees, only two sets of teeth were found to be perfect. (From Cole, *A. D. H. A. Journal,* January, 1930.)

When physicians and dentists realize that dental disorders constitute one of the earliest signs of an inferior physical condition (Howe, *A. D. H. A. Journal,* August, 1931) then there seems small need to further inquire into the WHY of dental hygiene in a public health program.

When in January of 1923 the Mississippi State Board of Health added a Division of Mouth Hygiene as a part of the Bureau of Child Hygiene, there were only four states having mouth hygiene programs as part of their public health work: North Carolina, Massachusetts, Virginia and Pennsylvania. These programs are of three kinds: reparative, educational, and a combination of both. In the reparative program, so called, the corrections are made at the expense of the state, county or both, with the patient usually also paying something for the operation, the educational feature being subordinated. In the educational program, the value of these fundamentals of mouth hygiene is taught and demonstrated, prophylaxis usually being done as part of the program, and corrections secured through educational means, the patients going to their family dentists. A combination program as sug-

gested partakes of these features, there usually being clinics to take care of the indigent.

In determining the type of activities to be followed in Mississippi, the features of these various programs were studied, and in accord with the already established policy of the state board of health, an educational program was inaugurated. The wisdom of this decision which was the desire of the informed leaders in the dental profession and also of Dr. Underwood, then head of the Bureau of Child Hygiene, has been amply borne out by the fact that of the dozen states adding mouth hygiene departments since the Mississippi work began, making a total of seventeen in operation now, practically al lof them conduct educational programs.

Some work in mouth hygiene had already been done in Mississippi with such results following as to attract national notice. All of the five elementary schools in Jackson had reached 100 per cent in dental corrections in the spring of 1920, Tupelo and New Albany followed the next year; so it was decided to enlarge upon the plan already in use and to place a teacher at the head of this, a teaching program. Since dental hygienists were especially trained for this type of program it was decided to use them instead of dentists.

Most of you are more or less familiar with the Mississippi program. You know that Mississippi is one of about twenty-nine states licensing the dental hygienists; one of the few having a dental member of the State Board of Health; one of the seventeen having mouth hygiene as one of the divisions or bureaus. You know that we have at present a supervisor; four county workers; dental hygienists in Hinds, Pike, Warren and a dentist in Lauderdale doing the same work as the hygienists in other counties; a school hygienist in Laurel; three white itinerant hygienists and one negro itinerant; making ten mouth hygiene workers in all.

You know that for many years the dentists of Mississippi have made inspections, especially of school children's mouths. While the inspections were begun at the suggestion of dentists who volunteered for this service, of course many have done it because it was "being done" and many of the examinations left much to be desired. The dental profession of Mississippi is as deeply conscious of the shortcomings in this volunteer program as is the health officer; yet much good has come from these inspections, as rapidly and as unevenly as they seem to be done. We continue them because we do not have a sufficient number of hygienists to do all of the examining and we recognize their educational value. With the health officers we have found that people do not think that conditions in a community fifty miles distant can bear any resemblance to the conditions in their own community. In fact, Mrs. Jones in the Rural Hill school may be vitally interested in her Jimmie's

mouth, while little Mary Brown's bad mouth leaves her feeling superior because she knows *that* conditions couldn't happen to *her* child. Consequently, it takes many a survey and much publicity to awaken and guide in the right direction, for, unfortunately, not all of our public is yet converted to mass-education with individual correction, rather than mass correction with chance education.

Instead of giving you any of the results of our Mississippi program which you will read in the biennial, and with which you keep in touch through the Mouth Hygiene Messenger, I shall refer to some of the objectives of our program and touch upon some of the difficulties in their accomplishments, giving you if I may the answer to some of your questions as to why dentists fail to more nearly carry out these ideals.

1. To educate the mother in proper died and dental care during pregnancy, infancy and childhood.
2. To establish the habit of having patients report to the dental office at least twice yearly for prophylaxis and repairs.
3. To adequately care for and preserve the temporary teeth until they are normally exfoliated.
4. To discover and fill or properly treat all developmental pits and fissures.

I. Several reasons prevent the dentist from doing much educational work along the lines of diet and proper dental care of pregnant women, infants and pre-school children: The dentist sees only a small percentage of these groups; he, like the physician, is not normally a teacher and he puts off doing that which he does poorly; many of our physicians and dentists were not instructed in the value of proper diet. Most of the research work in diet has been carried on since a large portion of the group in this room have left college, and unfortunately many of our men in both professions do little studying after they get into a general practice.

These statements are facts, not intended as alibis. It remains for those of us interested in public health to continue with unremitting effort to extend dental care and hygiene beginning in early infancy with the close cooperation of the pediatrician.

"Modern research has provided substantial evidence that dental caries depends upon a general metabolic disturbance based on faulty nutrition. Malocclusion is a problem of the growth and development of the jaw bones.

"In the experimental laboratories Mellanby, McCollum, Sherman (Howe) and others have shown that defects in the development of the teeth and jaws can be produced, arrested or prevented to a large extent by regulations of the diet.

"This indicates that, fundamentally, the prevention of dental caries, and diseases of bone lie well within the field of nutritional procedure. From mid-term in foetal life until late infancy, the teeth are dependent exclusively on nutrition, during which time the children are under the supervision of the family physician or the obstetrician and the pediatrician and it becomes their problem to advise the mother in matters of tooth development. The dentist as a rule has no direct contact with the child during this time and rarely sees the mother."

In Mississippi we are endeavoring through the services of the dental hygienists to do some of this educational work with these groups from prenatal life through childhood. I would like to see a dental hygienist associated with each one of our county health departments.

II. To establish the habit among patients of reporting twice yearly to the dentist for prophylaxis and repairs, we are again dependent upon our educational program as carried out by the hygienist and other public health workers. Certainly a dentist should never lose an opportunity of instructing an intelligent parent along these lines. There may be those who will think that he is drumming up trade, but if he is a good psychologist, he can know when his instruction will be properly received. Inertia and the fact that he will be criticised keep him from following this legitimate educational phase, the necessity for which can be easily illustrated by charts, models, and extracted teeth prepared for this purpose.

III. Of course there may still be some dentists who do not think taking care of the temporary teeth is necessary, just like there are still some physicians who disapprove of means used for diphtheria prevention. There are also some dentists who do not know how to handle children and haven't the courage to tell their parents so, thus giving them the chance to get proper care for their children elsewhere; but on the other hand, there are many difficulties in successfully handling temporary teeth. A cavity of any dependable size cannot be filled without having a pulp involvment with consequent pain for the patient. To extract the baby teeth too early will probably result in a crowded second set; to leave them may make a handicapped child. Of course the answer is to get the child to the dentist as soon as his first teeth are erupted, and at least every six months thereafter. If we continue to stress this educational phase, more children will be brought to the dentists in time, some of those who do not like to work for children will change their minds, some will die, and the graduates just out of college will, we hope, have the fundamental knowledge which will make them adequate operators for our children, serving the prime object of dentistry; a healthy body, which places dentistry in the broad field of health service.

IV. Our health education in mouth hygiene is teaching that there is no

such thing as a cavity too small to fill. The hygienists discover developmental pits and fissures, the parents take a child to the dentist and he tells them there are no defects or that the tooth doesn't need filling now. One of the reasons for doing this is that the dentist has seen so many of these fissures remain in the mouth a long time with no ill effects to the tooth. One must use his discretion, judging by the general condition of the tooth structure. Another reason is that the enamel is so hard that much grinding is necessary, and with a child probably not yet adjusted to the operation, an unfortunate reaction results; the dentist would rather do the more agreeable work and depend upon the tooth to stand until another visit. A third reason is that these fissures often must be radically cared for; to be effectively handled, it is often necessary to fill almost the entire top of the tooth, and the parent is likely to demur, thinking that the dentist is deliberately grinding away a perfectly good tooth to make work for himself. Perhaps the dentist can educate that parent up to having the work properly done, but it may take some time.

In conclusion, while we do not know any unfailing methods of preventing dental disease any more than we can be positively certain of preventing some of the other diseases, a mouth hygiene program is based upon the beliefs now generaly held that strong teeth and healthy mouths are the result of:

1. *Good nutrition,* with particular reference to the foods of the expectant and nursing mother, the infant and the growing child.
2. *Thorough mastication* as the first process in digestion and because teeth and jaws require exercise.
3. *Faithful use of the toothbrush* to dissolve mucin and remove food debris.
4. *Periodic prophylactic and dental care,* not only for correction of gross defects, but to remove plaques and accretions from all tooth surfaces and to discover and arrest initial development enamel pits and fissures.

It is these facts which the Division of Mouth Hygiene is teaching and demonstrating through its workers and teaching channels. During the past six years while it has been my privilege to be the first dental member of the State Board of Health, I have had the satisfaction of seeing mouth hygiene workers added, full-time county health departments added and a general growth of the service rendered by the State Board of Health. Within the state during a time when there is a general disposition to criticise any form of state service, the State Board of Health work remains unchallenged, ranking with the best in other states. This is due to wise leadership and faithful personnel. You have my best wishes for many years of growing and profitable service.

# The Dental Hygienist and Orthodontia

By W. R. DINHAM, D.M.D., *Seattle, Washington*

MANY subjects are included in the curriculum of a college course which because of non-use are soon forgotten. Sometimes the interest in them is lost due to the tendency of many of us to become so engrossed in our particular field that anything which does not have a direct bearing on our daily efforts is over-looked or disregarded.

Since the dental hygienist has been recognized by many states as being necessary to the best interests of public health it behooves her to continue to be well informed on all conditions relative to the area with which she is concerned. If at any time such is not the case then she is not completely fulfilling her obligations for which she was duly prepared, examined, and licensed.

The writer has always felt the need for the dental hygienist in dentistry, believing that she is as indispensable to the dental profession, if it is to fulfill its obligation to the public in the proper care of the teeth and their supporting structures, as the graduate nurse is to the medical profession, and surely the most prejudiced mind could not conceive of turning over to untrained women the duties of many branches of preventive medicine. It would seem therefore that the dental hygienist of today must fully realize how vital it is that she be ever ready to prove her value in the field of preventive dentistry by having a greater knowledge through study than is possible for her to obtain in the short course presented by the college.

The writer realizes that in discussing orthodontia he is no doubt merely reviewing a branch of dentistry which is familiar to all, but as he has previously stated it may be one on which such a review may stimulate a little closer observation and a recognition of a few causative factors in order that malocclusion with its associated harmful influence may be eliminated or at least minimized.

The dental hygienist, because of her contact with children of pre-school and early school age, has a splendid opportunity to render valuable aid to the field of preventive orthodontia. Any information given which will prevent or shorten the length of corrective treatment will be a service well worth all the time expended.

In as much as the hygienist must be informed regarding the causative factors of malocclusions if she is to advise parents, it becomes necessary for

us to consider the etiology bearing in mind that the causative factors many times are interwoven and may be likened to a chain of many links; therefore, it is very difficult to determine just what the influence or influences are with which we have to deal. Dr. McCoy has stated that in approaching this subject the fact should ever be borne in mind "that a given case of malocclusion is not necessarily always to be explained or attributed to one cause or one group of causes."

To place the responsibility of preventive orthodontia on the shoulders of any group of workers whether they be pediatricians, dentists, dental hygienists or others, seems most unreasonable but the fact remains that the better informed we all are regarding the etiology of maloccusion the more progress can be made in reducing their number or at least minimizing their severity.

Some influences, such as heredity and congenital disturbances, among which are anomalies of the numebr of teeth, abnormal frenum labium, abnormal tongues, etc. are not within our control but at the same time produce many pronounced cases of malocclusion.

Certain constitutional disorders may also be placed in this group such as: endocrine unbalance and infectious diseases of childhood, etc. There is, however, a constitutional disorder which is within the field of prevention and this is the disease of malnutrition which is characterized by faulty bone formation and is classified as rickets. The bone structure in this disease is not of sufficient strength to withstand the force of the muscles of mastication or afford proper support for the teeth. Thumb sucking and other pernicious habits, as well as harmful sleeping postures which might cause a pressure on the maxillary bones could more easily affect their shape when this disease is present. The proper dietary treatment should be prescribed, and the hygienist connected with the public schools can render a most valuable service by impressing upon the minds of the children and parents the importance of a correct diet.

Let us now review some of the direct or determining causes of malocclusion, for it is in this group that the hygienist can definitely give advice which in many instances would do much toward preventing a malformation of the jaws and irregularities of the teeth. When the deciduous teeth are lost prematurely the approximating teeth may drift either anteriorly or posteriorly occupying wholly or partially the space of the succeeding permanent tooth, this of course would result in the impaction or the diversion of the succedanceous tooth. The cusp relationship of the opposing teeth would be faulty and a long course of corrective treatment might be necesasry in order to reestablish normal occlusion, all of which might have

been avoided if the space had been maintained. Often the roots of the deciduous teeth are not absorbed normally, which also may result in their successors becoming impacted or erupting in a position outside or inside the line of occulusion. Before advising extraction of these teeth, the roots of which apparently have not been absorbed within the usual time, an x-ray picture should be taken in order to determine whether or not the succeeding tooth is present for it is not at all uncommon to find that the permanent tooth is congenitally missing. If such were the case it probably would be advisable to retain the deciduous tooth. The writer cannot emphasize too greatly the importance of a roentgenographic examination in all questionable cases, for this is the only definite source of information we have on which to base many of our decisions. Unerupted supernumerary teeth may also be discovered in this examination and unless removed may be the cause of much trouble. For illustration, occasionally we find an unerupted supernumerary tooth lodged between the upper central incisors preventing any possibility of their coming into proximal contact.

Another condition which exists frequently is the separation of the upper central incisors due to an abnormal development of the frenum labium. When this ligament is overdeveloped its surgical removal is indicated. We must, however, be very sure that we are dealing with an abnormal frenum, for if such is not the case it would very likely be unnecessary to have it removed.

A very large number of malocclusions are caused from pernicious habits namely, thumb sucking cheek biting, tongue biting, lip biting etc., all of which should be overcome. Unfortunately the effect of many of these habits is evident at the time the hygienist comes in contact with the child because a large percentage of them were formed during the earlier part of the child's life. When talking before parents the hygienist should call their attention to the ill effect of these habits and stress the necessity of their being overcome before any damage is done. When any child under her observation still perisists in these various harmful habits, it becomes the hygienist's duty to do all in her power to assist in breaking them.

Children in school often acquire injurious postural habits, in studying a child may develop a habit of resting his face on one or both hands creating an external pressure which if allowed to continue over a sufficient length of time could have an ill effect on the shape of the dental arches. Dr. Harvey Stallard has made a very extensive investigation on the effect of external pressures on the dental arches and has shown many cases of malocclusion which have been caused by incorrect sleeping postures, such as allowing the face to rest against the hands or arms.

Pathological conditions of the nose and throat are no doubt responsible

for many of the severe cases of mal-occlusion and facial deformities due to their affect upon normal breathing. The habitual mouth breather of long standing has certain definite characteristics which are easily recognized, such as: a short upper lip, a fullness in the nasal area of the face, protruding upper incisors, and in extreme cases the lower lip rests on the lingual surfaces of the upper incisors when the mouth is closed, most of these children are hollow chested, anemic and underweight. Had normal breathing been established early in the individual's life such characteristics as before mentioned would not have developed because this type of malocclusion is of a progressive nature becoming more complicated as the patient grows older.

One only has to be in the practice of orthodontia a short time before he realizes that many cases which come under his observation could have been prevented had intelligent advice been offered early. A large number of others presenting difficult complications and requiring years of treatment would have been greatly simplified if early treatment had been instituted. Lack of knowledge on the part of the parents and failure of others under whose observation the child has come to recognize and explain conditions are responsible for many such cases. Often the confidence in one who has been trusted with the care of the teeth of a child has been lost when the parent learns that they have not been advised as to conditions until the malocclusion has reached the extent where it will take years of corrective treatment with desired results questionable. The time has come in dentistry when patients not only expect reparative service but intelligent scientific advice as well and most especially from those engaged in the care of the mouths of children.

The dental hygienist is one of the greatest mediums through which the laity can be enlightened on the causative factors of malocclusion. Parents will be ever grateful for any advice that will tend toward a nomal alignment of the teeth with the subsequent harmonious development of the jaws and face. While a knowledge of the etiology is the first requisite in the field of perventive orthodontia, the dispensation of such knowledge must follow if others are to be benfited. In this regard you should bear in mind that it is much easier for the uniformed to grasp the full significance of your message if it is illustrated. A collection of models, charts, photographs, x-rays, etc., would prove of great value. An accumulation of such data can be made easily and the writer feels sure that orthodontists would be glad to assist those interested in gathering this material.

The dental hygienist is indeed fortunate in having a profession which affords such a varied field of endeavor. She may prefer educational duties in connection with the public schools, or she may desire to become associated

with a dentist and build a practice devoted to prophylaxes. Still another branch open to the dental hygienist is hospital and other institutional work and here her services in conjunction with the dental staff are very diversified as well as most interesting. When the public and dental profession as a whole become more familiar with the necessary service she is capable of rendering, a larger demand will follow and more fields will open for her.

Since experiencing the assistance of a dental hygienist in the practice of orthodontia the writer agrees with your past president, Miss Ethel Covington, when she stated in her paper entitled "The Dental Hygienist in an Orthodontist's Office" that "the exclusive orthodontia office is peculiarly adopted to the service of the dental hygienist." This paper was published in the "Journal of the American Dental Hygienists' Association, in April, 1931 and the writer recommends to those interested in this particular field that Miss Covington's subject be carefully studied as she has outlined in a most complete way the manner in which the dental hygienist can fill a very important part in an orthodontist's practice.

The following paragraph from an editorial by Dr. C. N. Johnson published in the "Journal of the American Dental Association" in January 1926, states that "When the possibilities and significance of Orthodontia are fully recognized by the world there shall be recorded for dentistry one of the greatest achievements and greatest tributes that has ever fallen to the fortunate lot of any calling." In closing the writer would like to say that he feels that while Dr. Johnson's remarks were applied to orthodontia, they can be directed equally as well to dentistry's greatest ally in the field of pervention, the dental hygienist. The possibilities of her influence on the health and future welfare of the coming generation are immeasurable and when fully recognized can only result in the sincere appreciation they deserve.

REFERENCES: "*Applied Orthodontia*" by DR. JAMES D. MCCOY.

## Book Reviews

*Principles and Practice of the Dental Assistant,* by SAMUEL FINE, D.M.D.

Graduate of Harvard University Dental School; Councillor in the Massachusetts State Dental Society; former School Dentist and Head of the College Dental Clinic in Fitchburg, Massachustts; Member of the American Dental Association and the Harvard Odontological Society. Published by the HAMILTON PUBLISHING COMPANY, 44 Portland Street, Worcester, Mass. Price $2.50.

Another book for the Dental Assistant but one in which the Dental Hygienist will obtain such information as will train her to be a general assistance to the dentist. It is concise in detail and well illustrated. The well-informed Dental Hygienist must be in a position to perform other duties than prophylaxis and the knowledge to be gained from a thorough study of Dr. Fine's new book will tend to make her services invaluable. There is not a chapter that does not contain something for the Dental Hygienist regardless of what her field of activity may be.

* * *

*Juvenile Dentistry,* by WALTER C. MCBRIDE, D.D.S., Detroit, Michigan.

Published by LEA & FEBIGER, Washington Square, Philadelphia. 182 pages with 80 engravings. Cloth, $2.27 net. Published 1932.

The first chapter of Dr. McBride's book deals with the mangement of the child; the second with management of the office. Other chapters on Prophylaxis, Diet, etc., should be of particular interest to the Dental Hygienist. In its entirety the book lends such information as would be of general use to anyone whose work brings them in contact with children.

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## Annual Meeting

The Ninth Annual Meeting of the American Dental Hygienists' Association will be held in Buffalo, New York, September 12th to 16th, 1932.

AGNES G. MORRIS,
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# QUESTION BOX

Questions you desire answered should be received by the Editor on or before the fifth day of the month preceding publication, in order to be answered in the forthcoming issue of THE JOURNAL.

1. When attempting to place a dental hygienist in a school district for the first time, who should be interviewed first; the school superintendent, a member of the board or some influential citizen?

*Answer.* One should have some knowledge of the district in question before making a definite decision but my experience has been, when in doubt, visit the Superintendent first. If you can sell him the idea, he will probably be the means of pointing out your best method of procedure and when the question finally comes up before the board for their decision, his opinion will have much weight.

2. When a child cries upon his first visit to the dentist, should he be quietly dismissed until another time or should an effort be made to do some type of work that will not hurt?

*Answer.* That is a question that almost has to be decided by the individual opeartor or his assistant alone. It may be a case of fear that can be over-come. On the other hand, it may be the child's state of mind and no amount of encouragement will avail. We can only bide our time until the child is willing. In the majority of cases, he will be a willing patient the second time.

3. How many prophylaxis should a dental hygienist in public school work be able to complete in one day?

*Answer.* She should be able to do at least ten each day without any extra effort unless she is forced to lose time from unexpected interruptions.

4. May interneship in Pennsylvania be served without first passing the State Board Examinations?

Answer. The State Board Examinations must be passed before the interneship is recognized by the State Board of Dental Examiners.

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